H. KÜNTZLER.

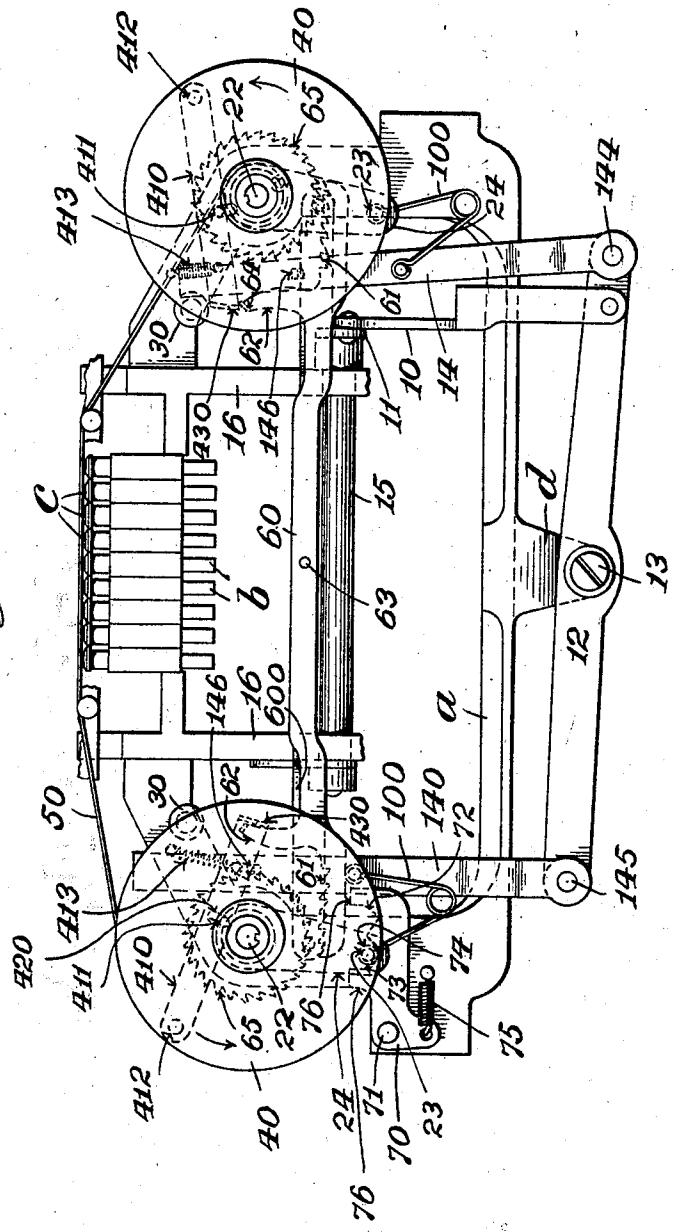
RIBBON FEEDING AND REVERSING MECHANISM FOR ADDING MACHINES.

APPLICATION FILED JUNE 18, 1908.

940,814. Patented Nov. 23, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

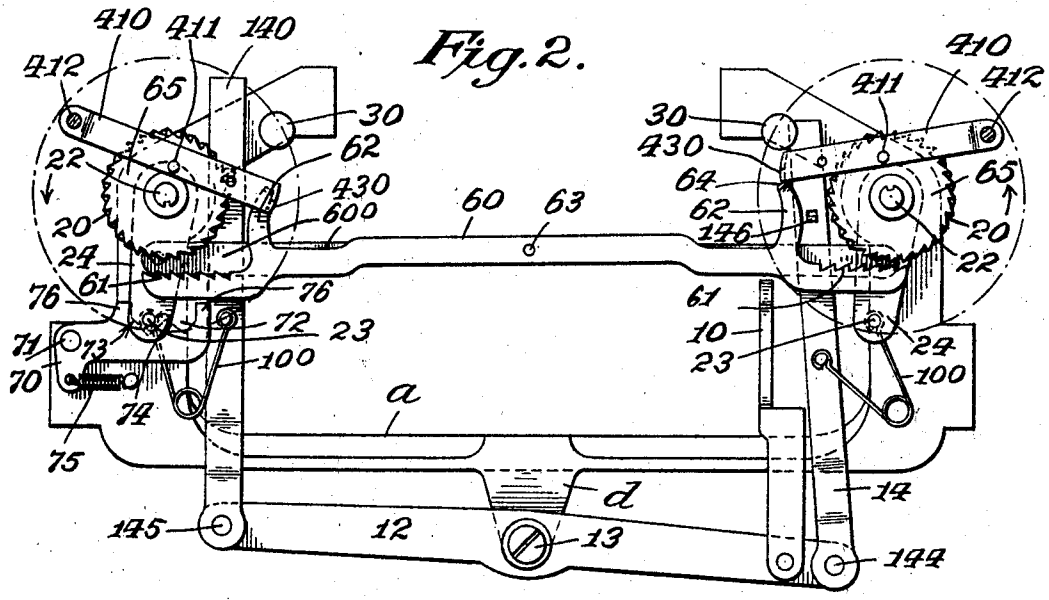
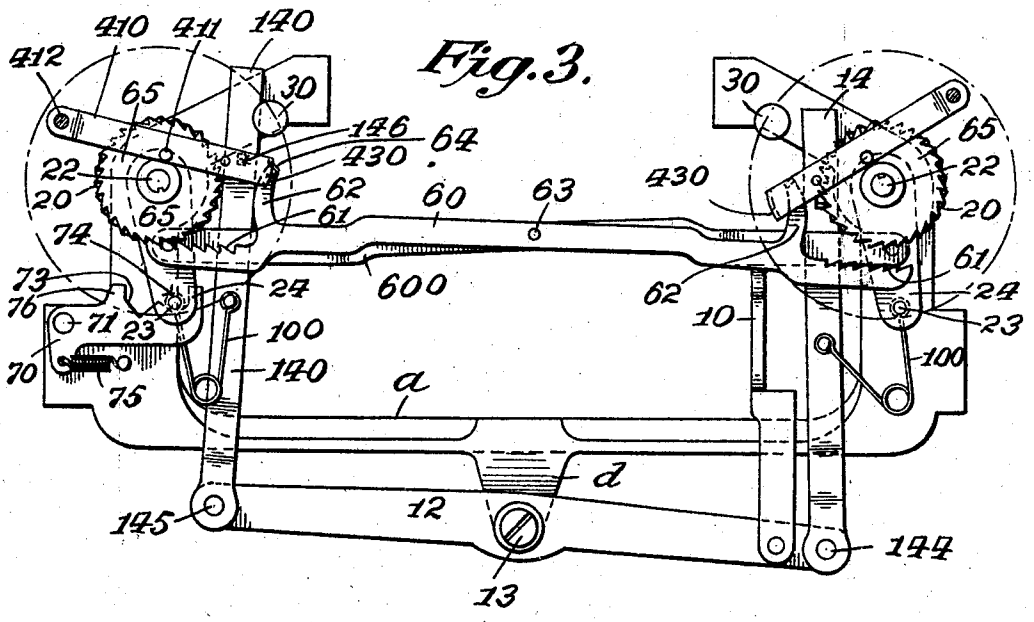


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

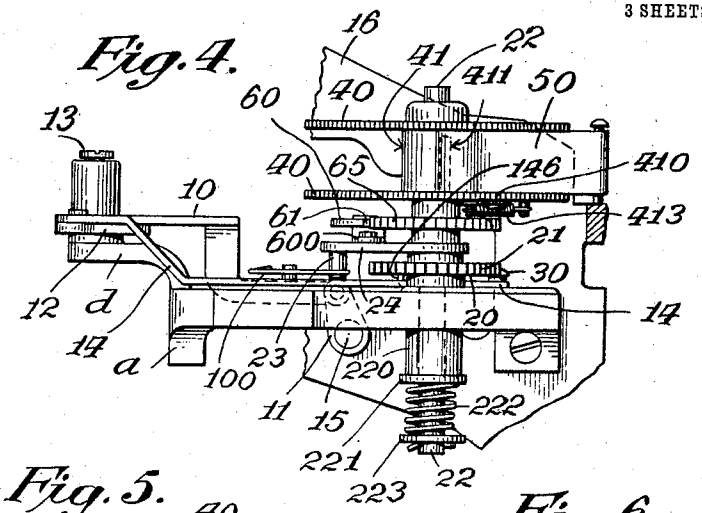


Fig. 5.

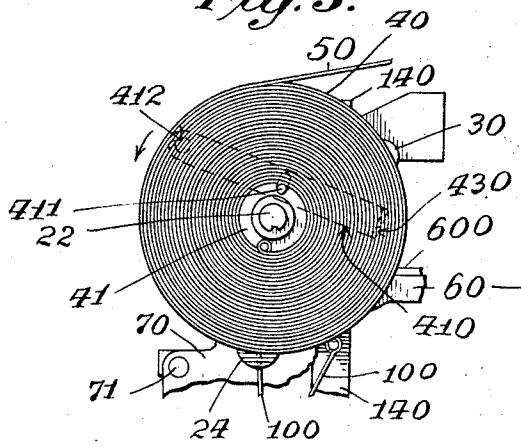


Fig. 6.

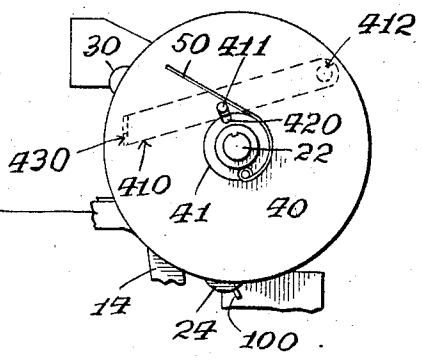


Fig. 7.

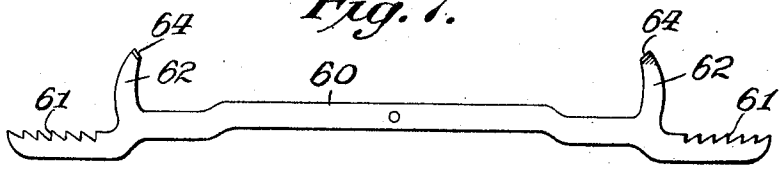
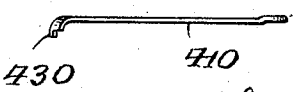


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY KÜNTZLER, OF KINGSTON, PENNSYLVANIA, ASSIGNOR TO THE ADDER MACHINE COMPANY, OF KINGSTON, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RIBBON FEEDING AND REVERSING MECHANISM FOR ADDING-MACHINES.

940,814. Specification of Letters Patent. Patented Nov. 23, 1909.

Application filed June 18, 1908. Serial No. 439,106.

To all whom it may concern:

Be it known that I, HENRY KÜNTZLER, a citizen of the United States, and resident of Kingston, Luzerne county, Pennsylvania, have invented certain new and useful Improvements in Ribbon Feeding and Reversing Mechanisms for Adding-Machines, of which the following is a specification.

This invention relates to ribbon feeding and reversing mechanisms for adding machines, and the like, and its novelty consists in the construction and adaptation of the parts, as will be more fully hereinafter pointed out.

Specifically the invention is an improvement upon the ribbon feeding and reversing mechanism used on the well known Wales adding machine, described in Letters Patent of the United States No. 796024, issued August 1, 1905.

In the use of the Wales machine, as with other machines of this same general nature, considerable trouble arises due to the strains brought upon the ribbon incident to reversing the ribbon moving mechanism. It was necessary to have the ribbon wound sufficiently compact upon the spools to reverse the movement immediately after the release of the mechanism and it was difficult to secure the degree of compactness of winding of the ribbon necessary to its prompt and efficient action.

The object of the present invention is to use the ribbon merely as a means for setting the reversing mechanism which latter is thereafter actuated by power derived from the main shaft of the machine, relieving the ribbon from the duty of itself actuating the reversing mechanism and to reverse the ribbon without the loss of a stroke of the actuating mechanism.

In the drawings, Figure 1 is a top plan view of a portion of an adding and printing machine provided with my invention; Fig. 2 is a similar view with the ribbon spools and some other parts removed; Fig. 3 is a view similar to Fig. 2 showing the parts in a different position; Fig. 4 is a side elevation of the parts shown in Fig. 1; Fig. 5 is a detail top plan view of the left spool with its upper disk removed and Fig. 6 is a similar view of the right spool. In Fig. 5 the ribbon is shown almost completely wound on the left spool and in Fig. 6 the ribbon is shown almost completely unwound on the right spool. Fig. 7 is a detail plan view of the transfer rack and Fig. 8 is an edge view of the setting lever.

In the drawings, *a* represents part of the frame of an adding and printing machine, the type bars being indicated at *b* and the face of the types at *c*.

The inking ribbon is represented at 50 and is adapted to be passed in front of the type-faces along the line of print, so that the impact of the type will force the ribbon smartly against a suitable platen provided for that purpose (and which is not shown) to press the ink against the paper carried by the platen to receive the impression of the particular type or types actuated.

A bracket *d* is provided on the frame of the machine. On this is pivoted a yoke 12 adapted to be reciprocated on its pivot 13 by means of a link 10 connected to a crank 11 secured to a rock shaft 15 mounted in a supplementary frame 16 and which shaft is rocked at each actuation of the main shaft of the machine through mechanism not shown and irrelevant to the present description.

14 and 140 are two pawl rods pivoted at 144 and 145, respectively, to the yoke 12 and which by its oscillations are reciprocated longitudinally of the machine. 146 are pawls upon these rods and are adapted to engage with the teeth 21 formed on the peripheries of the wheels 20 of the ribbon spools 41. The pawls 146 are yieldingly held in engagement with the teeth 21 by means of grasshopper springs 100 which also serve to move the pawl rods as hereinafter described. The wheels 20 are each secured upon a vertical shaft 22 to which is keyed a ribbon spool 41 provided with two guide disks 40. Beneath each wheel 20 and depending from the frame *a* is a cylindrical flange 220. Below it is a disk 221, and below it a similar disk 223, both keyed to the shaft. Between them is a coiled tension spring 222 serving as a yielding frictional connection between the shaft 22 and the frame *a*. A lever 24 is loosely mounted to oscillate on each shaft 22. They are each provided with a transverse pin 23 the lower end of which is engaged by the spring 100. The left pin is provided with a roller detent 74 hereinafter referred to. A cross rod 600

connects the levers 24 together and causes them to move in unison. Stop screws 30 are secured at suitable points on the frame *a* to limit the movements of the pawl rods 14 and 140.

Each ribbon spool has an end of the ribbon 50 removably secured to it so that it can be wound in either direction without being disengaged therefrom. An oblong radial slot 420 is formed in the spool 41 and lower disk 40, and is adapted to receive a pin 411 secured to and projecting upwardly from a setting lever 410, pivotally mounted at 412 on the lower disk 40 and under tension of a spring 413 constantly tending to pull it away from the center of the spool. When it is pulled outward as far as it will go its extremity 430 is nearer to the periphery of the disk.

60 is a bar provided at each end with a rack 61 and with a projection 62 and secured to the cross rod 600 by a pivot 63. Each projection 62 has an upwardly extending tip 64 adapted to engage the tip 430 of the setting lever 410.

Upon each shaft 22 are secured ratchet wheels 65 adapted to mesh with the racks 61 of the bars 60.

Secured to the frame *a* of the machine by a pivot 71 near the left spool is a positioner 70 having two notches 72 and 73 adapted to engage with the roller detent 74 mounted beneath the left lever 24, and provided with a spring 75 adapted to maintain said engagement. The notches 72 and 73 correspond substantially to the correct position of the detent 74 when the pawl 146 is out of and in engagement with the teeth 21 of the wheel 20. It serves to fix the position of the lever 24 accurately when it has been moved to either one of its two positions. It is provided with two guard arms 76 which prevent its accidental disengagement from the detent 74.

The mode of operating the device is as follows:—Suppose the parts are in the respective positions shown in Figs. 1, 2, 4, 5 and 6. The ribbon 50 has been wound upon the left spool and the reciprocation of the link 10, as it oscillates the yoke 12, moves the pawl rods 14 and 140. The former is, however, not in an actuating position while the latter is, and each of its reciprocations moves its pawl 146 against the teeth 21 of the wheel 20, and therefore rotates the shaft 22 and ribbon spool intermittently by a step by step motion. The detent roller 74 is also held in the notch 73 of the positioner 70 and the setting lever 410 of the left wheel is in its most retracted position while the setting lever 410 of the right wheel has moved to its farthest position (see Fig. 6) because the ribbon 50 no longer confines the pin 411 in the inner end of the slot 420 and the spring 413 has caused the lever 410 on the right wheel to move away from the spool 41. The next actuation of the main shaft of the machine moving the ribbon 50 toward the left another step, in the manner well understood in the art, causes the spool 41 and disk 40 to rotate and moves the extremity 430 of the lever 410 against the tip 64 of the projection 62 on the transfer rack 60 and swings the latter on its pivot 63, causing the rack 61 at its left end to engage with the left ratchet wheel 65 during the first half of the next stroke. During the remainder of this stroke this engagement causes the transfer rack to move bodily to the right carrying with it the bar 600 and consequently moving the levers 24, and causing the roller detent 74 to pass from the notch 73 to the notch 72. This movement of the levers 24 has been communicated to the pawl rods 14 and 140 through the grasshopper springs 100 and has caused the right pawl rod 14 to engage with the teeth 21 on the right wheel 20 and the left pawl rod 140 to disengage from the teeth 21 on the left wheel 20. The next actuation of the main shaft will cause the right wheel to rotate one step in the reverse direction. As this continues the ribbon is wound on the right spool and unwound on the left spool and, as the winding continues, the ribbon encircles and incloses the pin 411 and pulls it back into the slot 420 and so brings the end 430 of the lever 410 toward the center of the disk 40 and out of engaging position with the tip 64. The continued rotation of the right wheel will, as the ribbon is wound from the left wheel, finally bring into operation the reversing mechanism attached to that wheel and cause the direction of movement of the ribbon spools to be again reversed.

As will now readily be understood the improved device provides means whereby the reversing of the ribbon is caused by the actuation of the main shaft by a direct connection therewith and no longer entirely depends upon the mere pull of the ribbon as it is wound on its spool, but the movement of the ribbon serves merely to allow the setting lever to be moved to its operative position when thereafter the power to actuate the reversing rack comes from the main shaft of the machine and not from the tension of the ribbon.

In addition the unwinding of the ribbon on the one spool sets the transfer rack so that during the next stroke of the actuating pawl of the wound spool the transfer rack is by the setting lever of the unwound spool oscillated on its pivot to bring its teeth into engagement with the coöperating ratchet wheel on the wound spool which turning with the spool moves the transfer rack and through it the bar 600 and the positioning mechanism so that the final position of the stroke of the pawl is an effective and not

an idle one. In other words, the reversal of the winding mechanism and its partial actuation in the reverse direction has taken place all within the time of one stroke of the actuating pawl so that no undue tension has been brought to bear upon the ribbon due to its being wound on one spool after it has been fully unwound from the other.

What I claim as new is:—

1. In an adding and printing machine, a ribbon moving mechanism comprising two spools, on one of which the ribbon is wound as it is unwound from the other, actuating pawls, one for each spool, a connection between the pawls, ratchet disks one on each spool adapted to be engaged by their respective pawls, a connection between the pawls, reversing levers, a connection between the reversing levers and means for moving this connection, comprising a rack bar pivoted thereto and toothed disks on each spool adapted to engage the rack bar.

2. In an adding and printing machine, a ribbon moving mechanism comprising two spools, on one of which the ribbon is wound as it is unwound from the other, actuating pawls, one for each spool, a connection between the pawls, ratchet disks one on each spool adapted to be engaged by their respective pawls, a connection between the pawls, reversing levers, a connection between the reversing levers and means for moving this connection, comprising a rack bar pivoted thereto and toothed disks on each spool adapted to engage the rack bar and a setting lever on each spool adapted to engage the rack bar when the ribbon on its spool is unwound.

3. In an adding and printing machine, a ribbon moving mechanism comprising two spools on one of which the ribbon is wound as it is unwound from the other, actuating pawls, one for each spool, a connection between the pawls, ratchet disks one on each spool adapted to be engaged by their respective pawls, a connection between the pawls, a second set of ratchet disks one on each spool but adapted to be moved in opposite directions only, a bar adapted to coöperate with said second set of disks, reversing levers, and a connection between the reversing levers.

4. In an adding and printing machine, a ribbon moving mechanism comprising two spools on one of which the ribbon is wound as it is unwound from the other, actuating pawls, one for each spool, a connection between the pawls, ratchet disks one on each spool adapted to be engaged by their respective pawls, a connection between the pawls, a second set of ratchet disks one on each spool but adapted to be moved in opposite directions only, reversing levers, a connection between the reversing levers and means for moving this connector, comprising a rack bar pivoted thereto and adapted to engage each of the second set of ratchet disks alternately.

5. In an adding and printing machine, a ribbon moving mechanism comprising two spools on one of which the ribbon is wound as it is unwound from the other, actuating pawls, one for each spool, a connection between the pawls, ratchet disks one on each spool adapted to be engaged by their respective pawls, a connection between the pawls, a second set of ratchet disks one on each spool but adapted to be moved in opposite directions only, reversing levers, a connection between the reversing levers and means for moving this connector, comprising a rack bar pivoted thereto and adapted to engage each of the second set of ratchet disks alternately and a setting lever on each spool adapted to engage the rack bar when the ribbon on its spool is unwound.

6. In an adding and printing machine, a ribbon moving mechanism comprising two spools on one of which the ribbon is wound as it is unwound from the other, actuating pawls, one for each spool, a connection between the pawls, reversing levers, a connection between the reversing levers, reversing ratchet wheels, and a rack bar pivoted to the connection and comprising at each end ratchet teeth disposed in opposite directions to engage said reversing ratchet wheels.

7. In an adding and printing machine, a ribbon moving mechanism comprising two spools on one of which the ribbon is wound as it is unwound from the other, actuating pawls one for each spool, a connection between the pawls, reversing levers, a connection between the reversing levers and a rack bar pivoted thereto comprising at each end ratchet teeth disposed in opposite directions, disks one on each spool adapted to engage the rack bar, and a setting lever on each spool adapted to trip the rack into engagement with the disk on the other spool when its spool is unwound.

8. In a device of the kind described, two ribbon spools each provided with an actuating ratchet disk and a reversing ratchet disk, connected pawls adapted to engage the actuating ratchet disks, a rack bar adapted to alternately engage the reversing ratchet disks and means adapted to bring about such engagement on one spool when the ribbon on the other spool is unwound, comprising a setting lever on the unwound spool and a trip on the rack bar.

9. In a device of the kind described, two ribbon spools each provided with an actuating ratchet disk and a reversing ratchet disk, connected pawls adapted to engage the actuating ratchet disks, a rack bar adapted to alternately engage the reversing ratchet disks, a trip on the rack bar and means for

engaging the trip when one spool is unwound whereby the rack bar is caused to engage the reversing disk on the other spool.

10. In a device of the kind described, two ribbon spools each provided with an actuating ratchet disk and a reversing ratchet disk, connected pawls adapted to engage the actuating ratchet disks, a rack bar adapted to alternately engage the reversing ratchet disks, a trip on the rack bar and means for engaging the trip when one spool is unwound whereby the rack bar is caused to engage the reversing disk on the other spool, in combination with means for moving the pawl connection and rack bar together whereby when such engagement takes place the rack bar is bodily moved to engage the reversing disk on the unwound spool.

11. In a device of the kind described, two ribbon spools each provided with an actuating ratchet disk and a reversing ratchet disk, connected pawls adapted to engage the actuating ratchet disks, a rack bar adapted to alternately engage the reversing ratchet disks, a trip on the rack bar and means for engaging the trip when one spool is unwound whereby the rack bar is caused to engage the reversing disk on the other spool, in combination with means for moving the pawl connection and rack bar together whereby when such engagement takes place the rack bar is bodily moved to engage the reversing disk on the unwound spool, the latter means comprising a setting lever and a positioning detent.

Witness my hand this 17th day of June, 1908, at New York, N. Y.

HENRY KÜNTZLER.

Witnesses:
MAY HUGHES,
ALAN C. MCDONNELL.